

**REGULATIONS GOVERNING TRANSPORTATION AND UNLOADING
OF LIQUEFIED COMPRESSED GASES
FROM CARGO TANK MOTOR VEHICLES (HM-225A)**

**ONE-YEAR TECHNOLOGY ASSESSMENT MEETING
Des Plaines, Illinois**

June 27 - 28, 2000

Meeting Summary

Background

On May 24, 1999, the U.S. Department of Transportation's Research and Special Programs Administration (RSPA) published new regulations under docket HM-225A governing cargo tank unloading operations for liquefied compressed gases. The new regulations, which became effective July 1, 1999, were developed through a negotiated rulemaking.

The HM-225A regulations apply to cargo tanks used to transport and deliver liquefied compressed gases such as liquefied petroleum gas and anhydrous ammonia. The program combines measures to prevent unintentional releases during unloading operations with measures that will assure quick identification of releases and effective mitigation. The regulations include:

- ▶ Rigorous new inspection, maintenance, and testing requirements for cargo tank discharge systems, including hoses and hose assemblies.
- ▶ New requirements for monitoring unloading operations of certain liquefied compressed gases to take account of unique operating characteristics while assuring that the person attending the unloading operation can quickly determine if an unintentional release occurs.
- ▶ New requirements for state-of-the-art emergency discharge control equipment on cargo tank motor vehicles, such as passive systems that will shut down unloading without human intervention and remote control devices that enable an attendant to stop the unloading process at a distance from the vehicle. These requirements are keyed to the degree of risk associated with the transportation of specific liquefied compressed gases.
- ▶ A two-year period for technology development and testing. After two years, newly manufactured cargo tank motor vehicles must be equipped with the appropriate emergency discharge control equipment; cargo tank motor vehicles that are already in service must be retrofitted over a five-year period.

During the negotiated rulemaking, we suggested that periodic progress reviews would be needed

during the two-year development and testing cycle for emergency discharge control technology. These reviews will help foster communication between industry and government and function as a catalyst for critical development and testing needs that may occur. We highlighted our plans to work in partnership with the industry to assure widespread dissemination of information on the development and testing of emergency discharge control technology, including (1) surveying and cataloging industry efforts; (2) identification and communication of successes and problems; (3) monitoring or performing critical research and development; and (4) testing. This meeting was scheduled as a key step in this process.

Introductions

The meeting participants introduced themselves. The RSPA representative noted that this was an industry meeting, and that RSPA was in attendance as an observer. A list of meeting participants is attached.

Status of Retrofit

Several industry representatives reported on the status of the industry's efforts to retrofit its existing fleet of cargo tank motor vehicles to conform to the HM-225A requirements. No quantitative data on industry retrofits is available.

One industry representative reported that his company is planning to phase-in the installation of off-truck remote shut-off systems consistent with the HM-225A rule. Installation will be performed in repair shops, rather than in the field, to ensure reliability. This company is currently training its staff and working with inspectors. A weekly hose inspection program has been initiated. This company has not selected a passive shut-down system for installation on its transport cargo tank motor vehicles.

Technology Demonstrations

- ▶ **McTier Supply** demonstrated both an RF device and a newly designed passive device that is installed on a hose and, in the event of a break, activates the RF sensor and shuts down unloading.
- ▶ **DJT Products** demonstrated two RF devices and one passive shut-down system and distributed general information on the systems to all attendees. All DJT Products devices will be certified by a Design Certifying Engineer within the next several months.
- ▶ **BASE Engineering** demonstrated an RF device, highlighting the ruggedness of its design. BASE Engineering also presented information on a passive shut-down system that monitors the pressure in the piping system and shuts down the unloading operation if the pressure in the piping system falls below a threshold level.

- ▶ **Hart Engineering** discussed the key differences between crimped and bolted hose connections, emphasizing the importance of proper testing, inspection, and documentation to ensure safety.
- ▶ **DRM Safe Delivery Systems** demonstrated its passive shut-down system with a video showing the results of several hose failures on cargo tanks equipped with the system.
- ▶ **Smart-hose Technologies** showed a video demonstration of its products. This technology addresses hose failures; however, the company is currently developing a coupled hose/RF system that would shut down the unloading operation in the event of a failure of a component other than the hose.
- ▶ **Teleradio/DRUM** discussed its remote system, particularly its query and lockout features.
- ▶ **Rocket Supply** has developed a system in which product delivery is terminated if the signal between the transmitter and receiver is blocked.

In the discussion following the technology demonstrations, several participants noted how much more mature the technology for off-truck remotes is today than even a year ago. However, there was general agreement that interference with the off-truck remotes continues to be a problem.

Experience with Emergency Discharge Control Systems

A propane industry representative reported that his fleet began early testing of RF systems. The company identified and resolved a number of problems. The company selected a remote system with a hose reel-out capability. To date, the company has retrofitted 300 trucks. The company's biggest problem has been with driver acceptance of the new RF systems. Many drivers continue to make deliveries without their remotes. This representative noted that DOT should enforce the new HM-225A regulations equally across the board.

A representative of the anhydrous ammonia industry noted that there are differences between the transport of propane and ammonia that need to be addressed. However, he believes that the off-truck remote technology is developing well, and companies are beginning to experiment with a variety of systems. Many in the industry appear to be waiting to begin installing systems because they do not want to purchase outdated technology now and have to reinvest in new systems later. Generally, this representative agrees that the technology advances in RF devices have been swift, but not so for passive devices for transports.

Hose Management Programs

An industry representative noted that his company is making drivers responsible for hose

inspection and has experienced an increase in the number of hoses that have had to be replaced. Purchases of hoses have doubled. His company also has implemented a monthly inspection program and annual driver safety meetings. He provided some examples of forms his company uses to document hose inspections and discussed driver training. He stressed that in order for forms to be usable they must be user friendly. He commented that part-time drivers could be a problem due to insufficient training.

Problems

The participants discussed differences between the use of remote *versus* passive shutdown systems. There was some concern that passive shutdown system technology development is not as advanced as remote system technology. Again the issue of having to retrofit twice was raised. In addition, there is concern about the sensitivity of some passive systems. Passive systems that are too sensitive and shut down unloading during regular deliveries may cause drivers to try to circumvent the systems to speed up delivery times. One industry representative noted that his company is still investigating passive shutdown systems in transports and is concerned about false alarms. Another industry representative expressed concern about the July 1, 2001 deadline for beginning installation of passive shut-down systems on transports. He stated that it appears that passive system implementation is falling behind the power curve. Others also expressed concerns on the progress of passive shutdown systems for transports. However, another participant noted that there are several systems being certified and suggested that saying there are no workable systems available is too grim an assessment.

The participants also discussed the need for a uniform methodology for certification of passive systems. Industry representatives are concerned about how the certification process will work and how systems will be certified to operate in severe environmental conditions. The National Propane Gas Association will lead an initiative to examine the certification process.

Participants also discussed the need for appropriate training for state and federal inspectors. Many in the industry fear that enforcement will be inconsistent at the state and federal levels. Industry is particularly concerned that serious problems may be overlooked.

Emergency Response

An emergency response official addressed the meeting. He emphasized that cargo tank safety should be a joint effort between the industry and the fire services. He encouraged the participants to work with their local fire departments to train emergency services personnel on the new technologies and how the different systems can help emergency responders effectively handle cargo tank unloading emergencies.